

DETAILED ACTION

Specification

1. The disclosure is objected to because of the following informalities: At page 4, lines 19 and 20, the Specification makes reference to the claims. Claims should be limited to the claim section. At pages 23-25, the Specification refers to Table 1, but a review of the submitted documents does not indicate the presence of Table 1.
2. Appropriate correction is required.

Claim Objections

3. Claims 3, 31, and 32 are objected to because of the following informalities:
Regarding Claim 3, line 2, the phrase "max 7%" is informal. Regarding Claims 31 and 32, these claims should terminate with periods. Appropriate correction is required.
4. Claims 13 and 21 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form. Regarding Claims 13 and 21, the contemplated multilayered coating could exceed 10 microns with each sublayer assuming thickness values of 0.1 to 10 microns. However, previous Claim 1 requires that the total thickness be 10 microns. Hence, the subject matter of Claims 13 and 21, respectively, fails to further limit that of previous Claim 1.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:
6. The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.
7. Claims 1-36 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
8. Regarding Claim 1, it is unclear what is meant by the phrase "flaking or the like". It is unclear what is being contemplated as being like flaking but not flaking.
9. Regarding Claim 1, penultimate line, it is unclear whether "t" refers to the strip substrate or coated strip product thickness, as Figure 1 indicates.
10. Regarding Claim 2, it is unclear what is the antecedent basis of the phrase "strip substrate".
11. Regarding Claim 3, it is unclear what is meant by the phrase "the thickness of the strip". Is this the coated or uncoated strip material?
12. Regarding Claims 4-7, it is unclear what is the antecedent basis of the reference to a "substrate material". Is this necessarily not the coated material?
13. Regarding Claim 10, it is unclear whether the claimed material has been or heat treated or whether the claimed material were it to be heat treated must meet the claimed requirements. It is unclear whether the delta E relationship in Claim 10 is in addition to that of Claim 1.
14. Regarding Claim 11, it is unclear what is the antecedent basis of the phrase "the material". It is unclear whether the claimed material has been or heat treated or

Art Unit: 1784

whether the claimed material were it to be heat treated must meet the claimed requirements.

15. Regarding Claim 17, it is unclear what is the antecedent basis of the phrase "the material."

16. Regarding Claims 22-25 and 27, it is unclear what is meant by the term "normally." It is unclear whether the claimed color parameter coordinates set forth in each of these claims must be satisfied or not necessarily.

17. Regarding Claim 32, it is unclear what are the metal possibilities and what are the binary oxide possibilities. Must all listed metals and/or binary oxides be present?

18. Regarding Claim 33, it is unclear whether the suitable element must contain all of O, C, and N, or whether one of these elements is sufficient.

19. Regarding Claim 38, it is unclear whether the claimed strip substrate width is necessarily 400 mm. If not, it is unclear what is meant by the delta E requirement.

20. The following is a quotation of the first paragraph of 35 U.S.C. 112:

21. The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

22. Claims 37 and 38 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the

Art Unit: 1784

time the application was filed, had possession of the claimed invention.

Regarding Claim 37, the originally filed disclosure refers to the flaking test in terms of the thickness of the coated substrate thickness as per Figure 1.

Therefore, it is unclear what is the basis for defining “t” as being the thickness of the substrate alone. It is otherwise unclear how the prior art would support the amended definition of “t”.

Claim Rejections - 35 USC § 102/103

23. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

24. A person shall be entitled to a patent unless –

25. (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

26. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

27. (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

28. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

29. Determining the scope and contents of the prior art.

30. Ascertaining the differences between the prior art and the claims at issue.

31. Resolving the level of ordinary skill in the pertinent art.

32. Considering objective evidence present in the application indicating obviousness or nonobviousness.

Art Unit: 1784

33. Claims 1-4, 6, 9, 10, 12, 13, 16, 18-21, 25, 28, 32, 33, and 35-38 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Saida et al. USPN 4,763,601. Saida et al. teaches coating a strip of stainless steel with a roll-to-roll process with a coating of, for example, gold-colored TiN and SiO₂ bi-layer for decorative household applications such as mirrors. Saito et al. teaches EB coating technique, wherein the coating deposition is preceded by ion bombardment cleaning process. Saito teaches that bending coated strips at 180° at a radius of curvature of 2.5 times as large as the strip thickness causes no flaking. The thickness of the layer can be 200 nm and the thickness of the strip can be 0.5 mm. Stainless steel SUS 430 is exemplified. See Saida et al. (col. 1, lines 56-64; col. 3, lines 18-28; col. 5, lines 55-57; col. 7, line 46 through col. 8, line 16; col. 8, line 67 through col. 10, line 11; and Figure 6). Applicant's Admissions teach that SUS 430 is a ferritic stainless steel. See Specification (page 15). Applicant's Admissions teach that EB tolerances are within +/-30% maximally and "normally" +/- 20%. See Specification (page 7). Therefore, it would be expected that the applied EB layer in Saida would inherently achieve the claimed tolerance values. Since the coating of Saida is described as achieving a color, it would be expected to meet the claimed parameter values requirement in view of the broadly claimed range of parameters. Since applicant teaches that delta E correlates with coating thickness tolerance and since the coating tolerance would be expected to be satisfied, it would be expected that the claimed delta E requirement is satisfied.

See Specification (page 7). Saida does not mention whether the coated laminates meet the claimed bending test, although they are described as meeting a different bending test. Nevertheless, absent evidence to the contrary, it would be expected that the coatings of Saida would meet this claimed bending test since applicant has only characterized ion etching cleaning prior to deposition as being required for meeting the requirements of the claimed bending test. See Specification (page 19, top). Since Saida teaches performing such a pre-deposition ion bombardment cleaning step for the same purpose as applicant and since Saida achieves no flaking under a similar test to that claimed, it can be presumed absent evidence to the contrary that Saida's coatings would meet the claimed test as well. Regarding Claim 6, the cold-rolled tensile strength of SUS 430 is typically in a range which can exceed 500 MPa. See Allegheny Ludlum, DATASHEET on SUS430 (page 2) (ultimate tensile strength ranges include levels in excess of 500 MPa). Regarding Claim 10, to the extent that this is a product-by-process limitation, it would be expected that the article of Saida would be the same or substantially the same as one claimed since no heat treatment regime particulars are claimed that would preclude the claimed articles from encompassing those of Saida. Regarding Claims 16, 18-21, 32, and 33, while the articles of Saida may be made by a different process, it would be expected that the final products have the same or substantially the same structural and compositional properties and characteristics as those claimed in terms of explicitly claimed features and impliedly claimed features on account of the

Art Unit: 1784

product-by-process limitations, absent evidence to the contrary that the claimed articles could not encompass those of Saida.

Claim Rejections - 35 USC § 103

34. Claims 1-4, 6, 9, 10, 12, 13, 16, 18-21, 25, 28, 32, 33, and 35-38 are rejected under 35 U.S.C. 103(a) as obvious over Saida et al. USPN 4,763,601 in view of Applicant's Admissions. Saida et al. teaches coating a strip of stainless steel with a roll-to-roll process with a coating of, for example, gold-colored TiN and SiO₂ bi-layer for decorative household applications such as mirrors. Saito et al. teaches EB coating technique, wherein the coating deposition is preceded by ion bombardment cleaning process. Saito teaches that bending coated strips at 180° at a radius of curvature of 2.5 times as large as the strip thickness causes no flaking. The thickness of the layer can be 200 nm and the thickness of the strip can be 0.5 mm. Stainless steel SUS 430 is exemplified. See Saida et al. (col. 1, lines 56-64; col. 3, lines 18-28; col. 5, lines 55-57; col. 7, line 46 through col. 8, line 16; col. 8, line 67 through col. 10, line 11; and Figure 6). Applicant's Admissions teach that SUS 430 is a ferritic stainless steel. See Specification (page 15). Applicant's Admissions teach that EB tolerances are within +/-30% maximally and "normally" +/- 20%. See Specification (page 7). Therefore, it would be expected that the applied EB layer in Saida would inherently achieve the claimed tolerance values. Since the coating of Saida is described as achieving a color, it would be expected to meet the claimed parameter values requirement in view of the broadly claimed range of parameters. Since applicant

Art Unit: 1784

teaches that delta E correlates with coating thickness tolerance and since the coating tolerance would be expected to be satisfied, it would be expected that the claimed delta E requirement is satisfied. See Specification (page 7). Saida does not mention whether the coated laminates meet the claimed bending test, although they are described as meeting a different bending test. Nevertheless, absent evidence to the contrary, it would be expected that the coatings of Saida would meet this claimed bending test since applicant has only characterized ion etching cleaning prior to deposition as being required for meeting the requirements of the claimed bending test. See Specification (page 19, top). Since Saida teaches performing such a pre-deposition ion bombardment cleaning step for the same purpose as applicant and since Saida achieves no flaking under a similar test to that claimed, it can be presumed absent evidence to the contrary that Saida's coatings would meet the claimed test as well.

Regarding Claim 6, the cold-rolled tensile strength of SUS 430 is typically in a range which can exceed 500 MPa. See Allegheny Ludlum, DATASHEET on SUS430 (page 2) (ultimate tensile strength ranges include levels in excess of 500 MPa). Regarding Claim 10, to the extent that this is a product-by-process limitation, it would be expected that the article of Saida would be the same or substantially the same as one claimed since no heat treatment regime particulars are claimed that would preclude the claimed articles from encompassing those of Saida. Regarding Claims 16, 18-21, 32, and 33, while the articles of Saida may be made by a different process, it would be expected that the final products have

Art Unit: 1784

the same or substantially the same structural and compositional properties and characteristics as those claimed in terms of explicitly claimed features and impliedly claimed features on account of the product-by-process limitations, absent evidence to the contrary that the claimed articles could not encompass those of Saida. With respect to the thickness tolerance requirement, in the event that applicant's statement cannot be considered to be a prior art admission and in the event that Saida cannot be said to inherently teach this feature, Saida expresses concern for the uniformity of the coating layer in achieving favorable decorative, corrosion, and wear properties over the entire substrate area. Hence, it would have been obvious to one of ordinary skill in the art at the time of the invention to produce the coating layer with high degree of evenness, including those claimed, in order to achieve uniformity and favorable performance properties as suggested by Saida.

35. Claims 8, 14, 15, 22-24, 26, 27, 30-32, and 34 are rejected under 35 U.S.C.

103(a) as being unpatentable over Saida et al. USPN 4,763,601 in view of Miyajima et al. EP 416 887 and over Saida et al. USPN 4,763,601 in view of Applicant's Admissions in further view of Miyajima et al. EP 416 887. Saida and Saida et al. in view of Applicant's Admissions are relied upon as set forth above in the section 102/103 rejection and in the section 103 rejection, respectively. Saida et al. does not teach the claimed coating colors and compositions. Miyajima teaches coating materials for steel substrates comprised of the claimed materials and rendering a wide range of colors according to the claimed color

Art Unit: 1784

parameters. See Miyajima et al. (Abstract; page 3, line 1 through page 7, line 18). It would have been obvious to one of ordinary skill in the art at the time of the invention to prepare coating layers from any of the variety suggested by Miyajima in order to confer the substrate with a desired color as suggested by Miyajima. It would be expected that the coating systems taught and suggested by Miyajima would confer coatings exhibiting the wide range of claimed color parameters since Miyajima suggests a wide range and since the materials and thicknesses used in Miyajima are comparable to those of applicant that obtain the claimed color parameters.

36. Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over Saida et al. USPN 4,763,601 in view of Ebe et al. USPN 6,294,479 and over Saida et al. USPN 4,763,601 in view of Applicant's Admissions in further view of Ebe et al. USPN 6,294,479. Saida and Saida et al. in view of Applicant's Admissions are relied upon as set forth above in the section 102/103 rejection and in the section 103 rejection, respectively. Saida et al. does not teach the claimed strip speed. Ebe et al. teaches roll-to-roll vacuum evaporative coating of stainless steel strip, wherein the feed speed is 6 m/min. and wherein coating layer thicknesses are ca. 100 nm. Ebe teaches that film speed is a factor for production efficiency. See Ebe et al. (col. 6, line 32 through col. 7, line 44; col. 9, lines 3-37). It would have been obvious to one of ordinary skill in the art at the time of the invention to vary the strip speed of Saida and of Saida in view of Applicant's Admissions in order to optimize production efficiency, including to vary strip speeds to speeds

Art Unit: 1784

that are conventional in roll-to-roll production processes, such as 6 m/min as suggested by Ebe.

37. Claims 5, 7, 11, and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Saida et al. USPN 4,763,601 in view of Hultin-Stigenberg WO 93/07303 and over Saida et al. USPN 4,763,601 in view of Applicant's Admissions in view of Hultin-Stigenberg WO 93/07303. Saida et al. and Saida in view of Applicant's Admissions are relied upon as set forth above in the section 102/103 rejection and the section 103 rejection, respectively. Saida et al. does not teach the claimed steel substrate properties. Hultin-Stigenberg teaches using steel substrates that may be used in strip applications, wherein the steel materials meet the claimed soft-annealing and hardened tensile strength requirements. See Hultin-Stigenberg (page 3, final paragraph; Tables IVa and IVb). It would have been obvious to one of ordinary skill in the art at the time of the invention to substitute the strip material of Saida with any other conventional strip materials in order to confer functional and decorative coatings of Saida to the conventional strip material.

Conclusion

38. Any inquiry concerning this communication or earlier communications from the examiner should be directed to MICHAEL LA VILLA whose telephone number is (571)272-1539. The examiner can normally be reached on Monday through Friday.

Art Unit: 1784

39. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jennifer McNeil, can be reached on (571) 272-1540. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

40. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

**/MICHAEL LA VILLA/
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